



DEPARTMENT OF COMMUNITY
DEVELOPMENT
PLANNING DIVISION
TOWN OF WEST HARTFORD
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PERMIT APPLICATION FOR INLAND WETLANDS & WATERCOURSES
ACTIVITY: (check one of the following)

☐ **MAP AMENDMENT**

☒ **REGULATED ACTIVITY**

File #: 16W 1100

Date Received: 2.22.19

Street Address of Proposed Activity: 1678 Asylum Avenue

Zone: _____ Acreage/Lot Area: _____ Parcel/Lot#: _____

Application Fee: _____ Surcharge Fee: _____ Affidavit Fee: _____

Applicant's Interest in Property: Owner

University of Saint Joseph

Brief Description of Proposed Activity: Removal of existing running track and natural grass field
and construction of a new synthetic turf in its place. Construction of new athletic light poles.

The undersigned warrants the truth of all statements contained herein and in all supporting documents to the best of his/her knowledge and belief. Furthermore, the applicant agrees that submission of this document constitutes permission and consent to Commission and Staff inspections of the site. *Note: Notice is hereby given the Connecticut Department of Public Health must be notified by applicants for any project located within a public water supply aquifer protection area or watershed area. (CTDPH website at <http://www.dph.state.ct.us>)*

University of Saint Joseph

Same as owner

Record Owner's Name

Applicant's Name

1678 Asylum Avenue

Street

Street

West Hartford CT 06117

City State Zip

City State Zip

860-231-5220

Telephone #

Telephone #

Contact Person:

Shawn Harrington

Name

Applicant's Signature

1678 Asylum Avenue

Street

Signature of Owner/Authorized Agent

West Hartford CT 06117

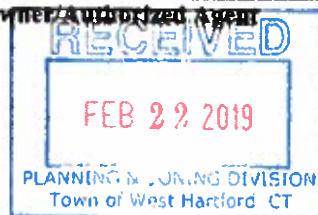
City State Zip

860-231-5220

Telephone #

sharrington@usj.edu

Email Address



University of Saint Joseph – Athletic Field Renovations

Stormwater Management Report

1 PROJECT NARRATIVE

1.1 Introduction

The project consists of the construction of a new multi-sport synthetic turf field and upgraded field lighting. Athletics are an integral component of student life at Saint Joseph's, and the University is looking to enhance and upgrade its current amenities. The proposed project development area is located at the northwest end of campus, within the footprint of the existing track and field. The track and natural grass field are in poor condition, and the University intends to remove these amenities and replace them with one new, lighted, multi purpose synthetic turf field to support the University's field hockey, soccer, and lacrosse programs.

The construction of the new synthetic turf field will occur entirely within previously disturbed areas. There will be no impact to surrounding trees, vegetation, or parking areas, and there will be no significant changes to actual land uses on the site. The project will result in alterations to existing cover conditions within the project area. This report describes the impact of the cover changes on surface runoff quantity and quality, and describes measures that have been incorporated into the design to ensure that there will be no detrimental impacts to downstream receiving waters.

In addition to permanent stormwater management measures, a comprehensive array of temporary soil erosion and sediment control measures (SESC) will be installed to serve the construction phase of the project. Disturbed areas of the site will be covered and stabilized as soon as practical to avoid exposure of bare soil. Sediment transport will be minimized through the use of barriers, diversions and other Best Management Practices. The SESC measures will be inspected and maintained throughout construction, and until final stabilization is achieved across the site.

As a result of these measures, the development is not expected to have any significant impacts on downstream water quality or quantity.

1.2 Site Location

The University of Saint Joseph is located at 1678 Asylum Avenue in West Hartford, CT and is bounded by Albany Avenue to the north, Steele Road to the east, and Trout Brook Drive to the west. The project development area is located at the northwest end of the campus, due west of the O'Connell Athletic Center. Six (6) existing tennis courts are located to the north of the development area, an asphalt walkway lines the eastern edge, and parking areas are located to the south. The development area currently consists of a 400-meter synthetic surfaced running track, and a natural grass multi-sport athletic field.

See Figure 1 for project location on USGS Topographic Map.

1.3 Site Topography

The existing natural grass field is crowned with a one and a half to two (1.5-2.0) percent pitch, draining east and west towards the track (center of field elevation: 105.75). To the north of the


University of Saint Joseph – Athletic Field Renovations

Stormwater Management Report

track and field, the topography slopes upwards approximately six (6) feet to the tennis courts (elevation: 112.00). To the east of the track and field the grade pitches down into a swale and then upwards three feet to an asphalt walkway/access drive (elevation: 106.00). To the south and west, the topography slopes down approximately three to four feet into the woodlands and wetland pockets (elevation 100.00).

1.4 Receiving Waters

The Saint Joseph's campus generally drains from the northeast to southwest. The developed area is surrounded by several wetlands that drain towards the southwest end of campus to more wetlands. The runoff eventually drains to Trout Brook which is part of the Subregional Basin 4403. The Town of West Hartford is included in the "Connecticut" major watershed area.



The analysis described in this report focuses on the area disturbed by the athletic improvements and will demonstrate that the peak runoff rates to the wetlands are reduced under all design storm conditions due to the installation of the stone base underneath the synthetic turf field and the removal of impervious area (track surfacing and sidewalk areas).

1.5 Soils Conditions

The Natural Resources Conservation Service (NRCS) Web Soil Survey identifies the following predominant soil type within the disturbed area.

- Udorthents Smoothed– This designation is reflective of disturbed conditions where few, if any remnants exist of the natural soil horizons. Erosion factors for use in the Universal Soil Loss Equation are K=0.28, and T=3. Udorthents soils are classified as Hydrologic Soil Group C.

Geotechnical investigations indicate that the site is at the interface of moraine deposits (medium compact sand, silt, and gravel) and glacial lake deposits (stiff silt and clay). The water table is within five (5) feet of finish grade, with all soils three (3) feet below grade being fully saturated from capillary water. The complete subsurface exploration program and geotechnical engineering evaluation report by Welti Geotechnical, P.C. is included as part of this application for reference.

1.6 Historic Flooding

The project area is not identified within a flood area on the FEMA Firm Map No. 09003C0361F effective 09/26/2008. A copy of the FEMA map is included within this report.

1.7 Alterations to Natural Drainageways

The new project area drains to an existing piped system. The proposed project replicates these drainageways.

University of Saint Joseph – Athletic Field Renovations

Stormwater Management Report

1.8 Methodology and Modeling Assumptions

Runoff and routing calculations have been performed for the watershed areas impacted by the project in both the pre-development and post-development conditions using HydroCAD® software. Time of concentration and runoff curve number calculations have been determined using the method described in NRCS Technical Release 55 – Urban Hydrology for Small Watersheds (TR-55). Time of concentration calculations have been amended where the value given by the TR-55 method is less than five minutes. In these cases a standard minimum value of five minutes has been used to keep this parameter within the acceptable working range of the model.

Design rainfall events have been modeled using the SCS Type III hydrograph for 24-hour duration storms. The rainfall depth for each return period is taken from *Table 7-2 – 2004 Connecticut Stormwater Quality Manual and ConnDOT Drainage Manual (2004)*. The rainfall depth values for standard design storm frequencies are given in the table below.

24-Hour Rainfall Depths for Hartford County, Connecticut at Design Storm Frequencies					
Table 7-2 – 2004 Connecticut Stormwater Quality Manual					
Frequency	1-Year	2-Year	10-Year	25-Year	100-Year
Rainfall Depth(in)	2.6	3.2	4.7	5.5	6.9

University of Saint Joseph – Athletic Field Renovations

Stormwater Management Report

2 STORMWATER ANALYSIS

2.1 Pre-Development Conditions

The pre-development condition has been analyzed at one design point. Design Point 1 (DP-1) is a catch basin at the wetland to the south of the project site. This catch basin has a 36" inlet and 36" outlet which is directed towards the southwestern end of the campus. The stormwater eventually enters Trout Brook to the southwest of campus.

The pre-development conditions analysis has been broken out into four (4) subcatchment areas:

- SC-A includes the natural grass field and a majority of the track running lanes and runways. Stormwater from this area drains to the collector pipes along the east and west edge of the field and connect into the large catch basin in the south D-zone. This large catch basin outlets via 36" RCP to the catch basin in the south wetland.
- SC-B includes the south D-zone area, the perimeter lawn area, and the wetlands to the south. Stormwater flows overland to the catch basin in the south wetland.
- SC-C includes the existing sidewalks and lawn area to the east of the running track. This area drains to several yard drains that connect to the large catch basin in the south D-zone and outlets via 36" RCP to the catch basin in the south wetland.
- SC-D includes the lawn area to the north of the track. Stormwater is collected by a series of yard drains, which connect to the field header pipe. The header pipe connects to the large catch basin in the south D-zone and outlets via 36" RCP to the catch basin in the south wetland.

Detailed descriptions of the subcatchment areas can be found in the HydroCAD runoff reports and on the pre-development watershed plan.

2.2 Post-Development Conditions

The same total drainage area and design point were analyzed in the post-development condition. The major changes in coverage are the construction of a new synthetic turf field and the removal of the existing running track and adjacent sidewalk. Approximately 30,500 sf of impervious area is being removed as a result of the proposed project.

The synthetic turf field is included in the model as Direct Entry (CN 98) since there is no depression storage, or evapotranspiration loss of rainfall that lands on the structure. Rainfall will drain directly through the surface of the field to the underlying base layer of highly porous crushed stone. The stone base will act as a large storage reservoir, detaining rainfall that enters the structure. It should be noted that the stone layer extends 6 inches beneath the field underdrain piping, providing significant storage volume prior to any stormwater discharging to the piped drainage system. The stone base layer is proposed to be the reclaimed/recycled track base stone material. If there is an inadequate volume of reclaimed materials for re-use, borrow crushed stone will be installed. This material is modeled as a pond with 30% voids.

Based on the geotechnical investigation, the soils are very saturated and will not infiltrate into the subsoils underneath the field. Therefore, no exfiltration has been used in the HydroCAD model.

University of Saint Joseph – Athletic Field Renovations

Stormwater Management Report

The underdrains are modeled as multiple vertical orifices that discharge to the larger collector pipes that collect and convey stormwater around the perimeter of the proposed turf field. The header pipe system will convey the rainfall to the existing structure to the south of the field.

Similar to the pre-development analysis, the post-development conditions analysis has been broken out into four (4) subcatchment areas:

- SC-A includes the synthetic turf field. Stormwater from this area will drain vertically to the panel drains which connect into the collector pipes along the east and west edge of the field. The collector pipe connects into the large catch basin in the south D-zone. This large catch basin outlets via 36" RCP to the catch basin in the south wetland.
- SC-B includes the south D-zone area that is to remain and the perimeter lawn area and wetlands to the south. Stormwater flows overland to the catch basin in the south wetland.
- SC-C includes the existing sidewalks and lawn area to remain to the east of the synthetic turf field. This area drains to several yard drains that connect to the large catch basin in the south D-zone and outlets via 36" RCP to the catch basin in the south wetland.
- SC-D includes the lawn area to the north of the track. Stormwater is collected by a series of yard drains, which connect to the field header pipe. The header pipe connects to the large catch basin in the south D-zone and outlets via 36" RCP to the catch basin in the south wetland.

Detailed descriptions of the subcatchment areas can be found in the HydroCAD runoff reports and on the post-development watershed plan. The runoff and routing analysis shows that there will be no increase in peak runoff from the proposed development under any design storm conditions.

Refer to the tables below for the peak flow and runoff volume comparisons in the 1-year, 2-year, 10-year, 25-year and 100-year storms.

Table 1 - Development Runoff Summary- Peak Flow (cfs)					
Design Point-1	Design Storm Event Return Period				
	1-Year	2-Year	10-Year	25-Year	100-Year
Pre-Dev	7.39	10.52	18.76	23.26	31.17
Post-Dev	4.20	6.03	11.48	15.31	21.58
Change	-3.19	-4.49	-7.28	-7.95	-9.59

Table 2 - Development Runoff Summary- Volume (acre-ft)					
Design Point-1	Design Storm Event Return Period				
	1-Year	2-Year	10-Year	25-Year	100-Year
Pre-Dev	0.558	0.788	1.409	1.757	2.381
Post-Dev	0.422	0.672	1.326	1.686	2.325
Change	-0.136	-0.116	-0.08	-0.071	-0.056

University of Saint Joseph – Athletic Field Renovations

Stormwater Management Report

2.3 Best Management Practices (BMPs) / State of Connecticut Requirements

No specific stormwater BMPs are proposed to be constructed as part of this project because there is no increase in impervious area. The majority of the running track and adjacent sidewalk are proposed to be removed, which results in a reduction of approximately 30,500 sf of impervious area from the pre- to post-development condition.

State Requirements:

- Section 7.4 Pollutant Reduction
 - There is no added impervious area to the proposed project; therefore, a specific BMP for the treatment of the water quality volume is not required.
 - Installation of the synthetic turf field eliminates the need for fertilizers and other legal lawn treatments; therefore, reducing the amount of these materials which can have a detrimental effect on the wetland habitat.
 - The field project proposes no vehicular use, so oil spills and other hazardous materials typical of parking lots/driveways will not be an issue.
- Section 7.5 Groundwater Recharge
 - Due to the highly saturated soils and high groundwater level, provisions to address the groundwater recharge volume are not feasible.
- Section 7.6 Peak Flow Control
 - Stream Channel Protection
 - The 2-year, 24-hour post development peak flow rate will be reduced to less than the 1-year, 24-hour pre-development peak flow rate.
 - 1 year pre-development flow rate = 7.39 cfs
 - 2 year post-development flow rate = 6.03 cfs
 - Conveyance Protection
 - The project's system is designed to the 10 year, 24-hour storm.
 - Peak Runoff Attenuation
 - The post-development peak flows will not result in any significant increase in the peak runoff from the site during design storm events of 2-year, 10 year, 25-year, and 100-year return periods.
 - Emergency Outlet Sizing
 - There are no proposed changes to the downstream outlets and the 100-year peak flow rates are being reduced; therefore, there should be no erosion at the existing outlets.

University of Saint Joseph – Athletic Field Renovations

Stormwater Management Report

3 CONCLUSIONS

The runoff and routing calculations demonstrate that the development will not result in any increase in the peak runoff from the site during design storm events of the 1-year, 2-year, 10-year, 25-year and 100-year return periods. Due to the installation of the large porous stone reservoir underneath the field, the project will be able to store runoff beneath the field before outletting from the system. Also, with the installation of synthetic turf in lieu of natural grass, the project will eliminate the need for fertilizers and other legal lawn treatments. Therefore, the project will not result in any adverse impact on the downstream wetlands or watershed.

4 REFERENCES

- CT Stormwater Manual (2004 and as amended)
- Connecticut Guidelines for Soil Erosion and Sediment Control (2002)
- NRCS Technical Release 378
- NRCS Web Soil Survey
- Geotechnical Study for Synthetic Turf Field at University of Saint Joseph, 1678 Asylum Avenue, West Hartford, CT by Welti Geotechnical, P.C. dated January 25, 2019